

In the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

1 to 10. (Canceled)

- 1 11. (New) A 4-bit carry look ahead circuit forming a combined propagate signal and a combined generated signal comprising:
 - 4 a first NAND gate (101) having a first input receiving a propagate signal from a first bit, a second input receiving a propagate signal from the second bit and an output;
 - 7 a second NAND gate (102) having a first input receiving a propagate signal from the third bit, a second input receiving a propagate signal from the fourth bit and an output;
 - 10 a NOR gate (103) having a first input connected to said output of said first NAND gate, a second input connected to said output of said second NAND gate and an output forming the combined propagate signal for the four bits;
 - 14 a first AND-NOR gate (201) having a first AND input receiving a generate signal from the first bit, a second AND input receiving a propagate signal from the second bit, a NOR input receiving a generate signal from the second bit and an output;
 - 19 a second AND-NOR gate (202) having a first AND input receiving a generate signal from the third bit, a second AND input receiving a propagate signal from the fourth bit, a NOR input receiving a generate signal from the fourth bit and an output; and
 - 24 a OR-NAND gate (251) having a first OR input connected to said output of said first AND-NOR gate, a second OR input connected to said output of said second NAND gate, a NAND input

27 connected to said output of said second AND-NOR gate and an
28 output forming the combined generate signal for the four bits.

1 12. (New) The carry look ahead circuit of claim 11, wherein:
2 said first and second AND-NOR gates include

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said first AND input,

6 a second P-channel transistor having a source-drain path
7 connected between a supply voltage and said first
8 intermediate node and a gate connected to said second AND
9 input,

10 a third P-channel transistor having a source-drain path
11 connected between said first intermediate node and the
12 output and a gate connected to said NOR input,

13 a first N-channel transistor having a source-drain path
14 connected between said output and a second intermediate node
15 and a gate connected to said first AND input,

16 a second N-channel transistor having a source-drain path
17 connected between said second intermediate node and
18 ground and a gate connected to said second AND input, and

19 a third N-channel transistor having a source-drain path
20 connected between said output and ground and a gate
21 connected to said NOR input.

1 13. (New) The carry look ahead circuit of claim 11, wherein:
2 said first and second AND-NOR gates include

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said NOR input,

6 a second P-channel transistor having a source-drain path
7 connected between a supply voltage and said first

8 intermediate node and said output and a gate connected to
9 said first AND input,

10 a third P-channel transistor having a source-drain path
11 connected between said first intermediate node and said
12 output and a gate connected to said second AND input,

13 a first N-channel transistor having a source-drain path
14 connected between said output and a second intermediate node
15 and a gate connected to said first AND input,

16 a second N-channel transistor having a source-drain path
17 path connected between said second intermediate node and
18 ground and a gate connected to said second AND input, and

19 a third N-channel transistor having a source-drain path
20 connected between said output and ground and a gate
21 connected to said NOR input.

1 14. (New) The carry look ahead circuit of claim 11, wherein:
2 said OR-NAND gate includes

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said second OR input,

6 a second P-channel transistor having a source-drain path
7 path connected between said first intermediate node and said
8 output and a gate connected to said first OR input,

9 a third P-channel transistor having a source-drain path
10 connected between the supply voltage and said output and a
11 gate connected to said NAND input,

12 a first N-channel transistor having a source-drain path
13 connected between said output and a second intermediate node
14 and a gate connected to said OR input,

15 a second N-channel transistor having a source-drain path
16 connected between said second intermediate node and
17 ground and a gate connected to said first OR input, and

18 a third N-channel transistor having a source-drain path
19 connected between said second intermediate node and ground
20 and a gate connected to said second OR input.

1 15. (New) The carry look ahead circuit of claim 11, wherein:
2 said OR-NAND gate includes

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said second OR input,

6 a second P-channel transistor having a source-drain path
7 connected between said first intermediate node and said
8 output and a gate connected to said first OR input,

9 a third P-channel transistor having a source-drain path
10 connected between the supply voltage and said output and a
11 gate connected to said NAND input,

12 a first N-channel transistor having a source-drain path
13 connected between said output and a second intermediate node
14 and a gate connected to said first OR input,

15 a second N-channel transistor having a source-drain path
16 path connected between said output and said second
17 intermediate node and a gate connected to said second OR
18 input, and

19 a third N-channel transistor having a source-drain path
20 connected between said second intermediate node and ground
21 and a gate connected to said NAND input.

1 16. (New) A 5-bit carry look ahead circuit forming a
2 combined propagate signal and a combined generated signal
3 comprising:

4 a first NAND gate (104) having a first input receiving a
5 propagate signal from the first bit, a second input receiving a
6 propagate signal from the second bit and an output;

7 a second NAND gate (105) having a first input receiving a
8 propagate signal from the third bit, a second input receiving a
9 propagate signal from the fourth bit and an output;

10 a first NOR gate (106) having a first input connected to
11 said output of said first NAND gate, a second input connected to
12 said output of said second NAND gate and an output;

13 a second NOR gate (107) having a first input connected to
14 said output of said first NOR gate, a second input receiving a
15 propagate signal from the fifth bit and an output;

16 a first inverter (301) having a input connected to said
17 output of said second NOR gate and an output generating the
18 combined propagate signal for the five bits;

19 a first AND-NOR gate (203) having a first AND input
20 receiving a generate signal from the first bit, a second AND
21 input receiving a propagate signal from the second bit, a NOR
22 input receiving a generate signal from the second bit and an
23 output;

24 a second AND-NOR gate (204) having a first AND input
25 receiving a generate signal from the third bit, a second AND
26 input receiving a propagate signal from the fourth bit, a NOR
27 input receiving a generate signal from the fourth bit and an
28 output;

29 a OR-NAND gate (252) having a first OR input connected to
30 said output of said first AND-NOR gate, a second OR input
31 connected to said output of said second NAND gate, a NAND input
32 connected to said output of said second AND-NOR gate and an
33 output forming the combined generate signal for the four bits;

34 a third AND-NOR gate (205) having a first AND input
35 connected to said output of said OR-NAND gate, a second AND input
36 receiving a propagate signal from the fifth bit, a NOR input
37 receiving a generate signal from the fifth bit and an output; and

38 a second inverter (302) having an input connected to said
39 output of said third AND-NOR gate and an output generating the
40 combined generate signal for the five bits.

1 17. (New) The carry look ahead circuit of claim 16, wherein:
2 said first, second and third AND-NOR gates include

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said first AND input,

6 a second P-channel transistor having a source-drain path
7 connected between a supply voltage and said first
8 intermediate node and a gate connected to said second AND
9 input,

10 a third P-channel transistor having a source-drain path
11 connected between said first intermediate node and the
12 output and a gate connected to said NOR input,

13 a first N-channel transistor having a source-drain path
14 connected between said output and a second intermediate node
15 and a gate connected to said first AND input,

16 a second N-channel transistor having a source-drain path
17 connected between said second intermediate node and
18 ground and a gate connected to said second AND input, and

19 a third N-channel transistor having a source-drain path
20 connected between said output and ground and a gate
21 connected to said NOR input.

1 18. (New) The carry look ahead circuit of claim 16, wherein:
2 said first, second and third AND-NOR gates include

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said NOR input,

6 a second P-channel transistor having a source-drain
7 path connected between a supply voltage and said first
8 intermediate node and said output and a gate connected to
9 said first AND input,

10 a third P-channel transistor having a source-drain path
11 connected between said first intermediate node and said
12 output and a gate connected to said second AND input,

13 a first N-channel transistor having a source-drain path
14 connected between said output and a second intermediate node
15 and a gate connected to said first AND input,

16 a second N-channel transistor having a source-drain path
17 connected between said second intermediate node and
18 ground and a gate connected to said second AND input, and

19 a third N-channel transistor having a source-drain path
20 connected between said output and ground and a gate
21 connected to said NOR input.

1 19. (New) The carry look ahead circuit of claim 16, wherein:
2 said OR-NAND gate includes

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said second OR input,

6 a second P-channel transistor having a source-drain path
7 connected between said first intermediate node and said
8 output and a gate connected to said first OR input,

9 a third P-channel transistor having a source-drain path
10 connected between the supply voltage and said output and a
11 gate connected to said NAND input,

12 a first N-channel transistor having a source-drain path
13 connected between said output and a second intermediate node
14 and a gate connected to said OR input,

15 a second N-channel transistor having a source-drain
16 path connected between said second intermediate node and
17 ground and a gate connected to said first OR input, and
18 a third N-channel transistor having a source-drain path
19 connected between said second intermediate node and ground
20 and a gate connected to said second OR input.

1 20. (New) The carry look ahead circuit of claim 16, wherein:
2 said OR-NAND gate includes
3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said second OR input,
6 a first N-channel transistor having a source-drain path
7 connected between said output and a second intermediate node
8 and a gate connected to said first OR input,
9 a second P-channel transistor having a source-drain path
10 path connected between said first intermediate node and said
11 output and a gate connected to said first OR input,
12 a third P-channel transistor having a source-drain path
13 connected between the supply voltage and said output and a
14 gate connected to said NAND input,
15 a second N-channel transistor having a source-drain
16 path connected between said output and said second
17 intermediate node and a gate connected to said second OR
18 input, and
19 a third N-channel transistor having a source-drain path
20 connected between said second intermediate node and ground
21 and a gate connected to said NAND input.

1 21. (New) A 5-bit carry look ahead circuit forming a
2 combined propagate signal and a combined generated signal
3 comprising:

4 a first NAND gate (108) having a first input receiving a
5 propagate signal from the first bit, a second input receiving a
6 propagate signal from the second bit and an output;

7 a second NAND gate (109) having a first input receiving a
8 propagate signal from the third bit, a second input receiving a
9 propagate signal from the fourth bit and an output;

10 a first inverter (303) having an input connected to said
11 output of said second NAND gate and an output;

12 a third NAND gate (119) having a first input connected to
13 said output of said first inverter, a second input receiving a
14 propagate signal from the fifth bit and an output;

15 a NOR gate (111) having a first input connected to said
16 output of said first NAND gate, a second input connected to said
17 output of said third NAND gate and an output generating the
18 combined propagate signal for the five bits;

19 a first AND-NOR gate (206) having a first AND input
20 receiving a generate signal from the first bit, a second AND
21 input receiving a propagate signal from the second bit, a NOR
22 input receiving a generate signal from the second bit and an
23 output;

24 a second AND-NOR (207) gate having a first AND input
25 receiving a generate signal from the third bit, a second AND
26 input receiving a propagate signal from the fourth bit, a NOR
27 input receiving a generate signal from the fourth bit and an
28 output;

29 a second inverter (304) having an input connected to said
30 output of said second AND-NOR gate and an output;

31 a third AND-NOR gate (208) having a first AND input
32 connected to said output of said second inverter, a second AND
33 input receiving a propagate signal from the fifth bit, a NOR
34 input receiving a generate signal from the fifth bit and an
35 output; and

36 a OR-NAND gate (253) having a first OR input connected to
37 said output of said first AND-NOR gate, a second OR input
38 connected to said output of said third AND-NOR gate, a NAND input
39 connected to said output of said third AND-NOR gate and an output
40 forming the combined generate signal for the four bits.

1 22. (New) The carry look ahead circuit of claim 21, wherein:
2 said first, second and third AND-NOR gates include

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said first AND input,

6 a second P-channel transistor having a source-drain path
7 connected between a supply voltage and said first intermediate node and a gate connected to said second AND input,

8 a third P-channel transistor having a source-drain path
9 connected between said first intermediate node and the
10 output and a gate connected to said NOR input,

11 a first N-channel transistor having a source-drain path
12 connected between said output and a second intermediate node
13 and a gate connected to said first AND input,

14 a second N-channel transistor having a source-drain path
15 connected between said second intermediate node and
16 ground and a gate connected to said second AND input, and

17 a third N-channel transistor having a source-drain path
18 connected between said output and ground and a gate
19 connected to said NOR input.

20 23. (New) The carry look ahead circuit of claim 21, wherein:
21 said first, second and third AND-NOR gates include

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said NOR input,

6 a second P-channel transistor having a source-drain path
7 connected between a supply voltage and said first
8 intermediate node and said output and a gate connected to
9 said first AND input,

10 a third P-channel transistor having a source-drain path
11 connected between said first intermediate node and said
12 output and a gate connected to said second AND input,

13 a first N-channel transistor having a source-drain path
14 connected between said output and a second intermediate node
15 and a gate connected to said first AND input,

16 a second N-channel transistor having a source-drain path
17 connected between said second intermediate node and
18 ground and a gate connected to said second AND input, and

19 a third N-channel transistor having a source-drain path
20 connected between said output and ground and a gate
21 connected to said NOR input.

1 24. (New) The carry look ahead circuit of claim 21, wherein:
2 said OR-NAND gate includes

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said second OR input,

6 a second P-channel transistor having a source-drain path
7 connected between said first intermediate node and said
8 output and a gate connected to said first OR input,

9 a third P-channel transistor having a source-drain path
10 connected between the supply voltage and said output and a
11 gate connected to said NAND input,

12 a first N-channel transistor having a source-drain path
13 connected between said output and a second intermediate node
14 and a gate connected to said OR input,

15 a second N-channel transistor having a source-drain path
16 connected between said second intermediate node and
17 ground and a gate connected to said first OR input, and

18 a third N-channel transistor having a source-drain path
19 connected between said second intermediate node and ground
20 and a gate connected to said second OR input.

1 25. (New) The carry look ahead circuit of claim 21, wherein:
2 said OR-NAND gate includes

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said second OR input,

6 a second P-channel transistor having a source-drain path
7 connected between said first intermediate node and said
8 output and a gate connected to said first OR input,

9 a third P-channel transistor having a source-drain path
10 connected between the supply voltage and said output and a
11 gate connected to said NAND input,

12 a first N-channel transistor having a source-drain path
13 connected between said output and a second intermediate node
14 and a gate connected to said first OR input,

15 a second N-channel transistor having a source-drain path
16 connected between said output and said second
17 intermediate node and a gate connected to said second OR
18 input, and

19 a third N-channel transistor having a source-drain path
20 connected between said second intermediate node and ground
21 and a gate connected to said NAND input.

1 26. (New) A 5-bit carry look ahead circuit forming a
2 combined propagate signal and a combined generated signal
3 comprising:

4 a first NAND gate (112) having a first input receiving a
5 propagate signal from the second bit, a second input receiving a
6 propagate signal from the third bit and an output;

7 a second NAND gate (113) having a first input receiving a
8 propagate signal from the fourth bit, a second input receiving a
9 propagate signal from the fifth bit and an output;

10 a NOR gate (114) having a first input connected to said
11 output of said first NAND gate, a second input connected to said
12 output of said second NAND gate and an output;

13 a third NAND gate (115) having a first input receiving the
14 propagate signal from the first bit, a second input connected to
15 said output of said NOR gate and an output;

16 a first inverter (305) having an input connected to said
17 output of said third NAND gate and an output generating the
18 combined propagate signal for the five bits;

19 a first AND-NOR gate (209) having a first AND input
20 receiving a propagate signal from the third bit, a second AND
21 input receiving a generate signal from the second bit, a NOR
22 input receiving a generate signal from the third bit and an
23 output;

24 a second AND-NOR (210) gate having a first AND input
25 receiving a propagate signal from the fifth bit, a second AND
26 input receiving a generate signal from the fourth bit, a NOR
27 input receiving a generate signal from the fifth bit and an
28 output;

29 a OR-NAND gate (254) having a first OR input connected to
30 said output of said first AND-NOR gate, a second OR input
31 connected to said output of said second NAND gate, a NAND input

32 connected to said output of said first AND-NOR gate and an
33 output;

34 a third AND-NOR gate (211) having a first AND input
35 connected to said output of said NOR gate, a second AND input
36 receiving a generate signal from the first bit, a NOR input
37 connected to said output of said OR-NAND gate and an output; and
38 a second inverter (306) having an input connected to said
39 output of said third AND-NOR gate and an output generation the
40 combined generate signal for the five bits.

1 27. (New) The carry look ahead circuit of claim 26, wherein:
2 said first, second and third AND-NOR gates include

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said first AND input,

6 a second P-channel transistor having a source-drain path
7 connected between a supply voltage and said first
8 intermediate node and a gate connected to said second AND
9 input,

10 a third P-channel transistor having a source-drain path
11 connected between said first intermediate node and the
12 output and a gate connected to said NOR input,

13 a first N-channel transistor having a source-drain path
14 connected between said output and a second intermediate node
15 and a gate connected to said first AND input,

16 a second N-channel transistor having a source-drain path
17 connected between said second intermediate node and
18 ground and a gate connected to said second AND input, and

19 a third N-channel transistor having a source-drain path
20 connected between said output and ground and a gate
21 connected to said NOR input.

1 28. (New) The carry look ahead circuit of claim 26, wherein:
2 said first, second and third AND-NOR gates include
3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said NOR input,
6 a second P-channel transistor having a source-drain path
7 connected between a supply voltage and said first
8 intermediate node and said output and a gate connected to
9 said first AND input,
10 a third P-channel transistor having a source-drain path
11 connected between said first intermediate node and said
12 output and a gate connected to said second AND input,
13 a first N-channel transistor having a source-drain path
14 connected between said output and a second intermediate node
15 and a gate connected to said first AND input,
16 a second N-channel transistor having a source-drain path
17 path connected between said second intermediate node and
18 ground and a gate connected to said second AND input, and
19 a third N-channel transistor having a source-drain path
20 connected between said output and ground and a gate
21 connected to said NOR input.

1 29. (New) The carry look ahead circuit of claim 26, wherein:
2 said OR-NAND gate includes
3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said second OR input,
6 a second P-channel transistor having a source-drain path
7 path connected between said first intermediate node and said
8 output and a gate connected to said first OR input,

9 a third P-channel transistor having a source-drain path
10 connected between the supply voltage and said output and a
11 gate connected to said NAND input,

12 a first N-channel transistor having a source-drain path
13 connected between said output and a second intermediate node
14 and a gate connected to said OR input,

15 a second N-channel transistor having a source-drain path
16 path connected between said second intermediate node and
17 ground and a gate connected to said first OR input, and

18 a third N-channel transistor having a source-drain path
19 connected between said second intermediate node and ground
20 and a gate connected to said second OR input.

1 30. (New) The carry look ahead circuit of claim 26, wherein:
2 said OR-NAND gate includes

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said second OR input,

6 a second P-channel transistor having a source-drain path
7 path connected between said first intermediate node and said
8 output and a gate connected to said first OR input,

9 a third P-channel transistor having a source-drain path
10 connected between the supply voltage and said output and a
11 gate connected to said NAND input,

12 a first N-channel transistor having a source-drain path
13 connected between said output and a second intermediate node
14 and a gate connected to said first OR input,

15 a second N-channel transistor having a source-drain path
16 path connected between said output and said second
17 intermediate node and a gate connected to said second OR
18 input, and

19 a third N-channel transistor having a source-drain path
20 connected between said second intermediate node and ground
21 and a gate connected to said NAND input.

1 31. (New) A 5-bit carry look ahead circuit forming a
2 combined propagate signal and a combined generated signal
3 comprising:

4 a first NAND gate (116) having a first input receiving a
5 propagate signal from the second bit, a second input receiving a
6 propagate signal from the third bit and an output;

7 a second NAND gate (117) having a first input receiving a
8 propagate signal from the fourth bit, a second input receiving a
9 propagate signal from the fifth bit and an output;

10 a NOR gate (118) having a first input connected to said
11 output of said first NAND gate, a second input connected to said
12 output of said second NAND gate and an output;

13 a third NAND gate (119) having a first input receiving the
14 propagate signal from the first bit, a second input connected to
15 said output of said NOR gate and an output;

16 a first inverter (310) having an input connected to said
17 output of said third NAND gate and an output generating the
18 combined propagate signal for the five bits;

19 a first AND-NOR gate (212) having a first AND input
20 receiving a propagate signal from the third bit, a second AND
21 input receiving a generate signal from the second bit, a NOR
22 input receiving a generate signal from the third bit and an
23 output;

24 a second AND-NOR (213) gate having a first AND input
25 receiving a propagate signal from the fifth bit, a second AND
26 input receiving a generate signal from the fourth bit, a NOR
27 input receiving a generate signal from the fifth bit and an
28 output;

29 a second inverter (307) having an input receiving a generate
30 signal from the first bit and an output;
31 a OR-NAND gate (255) having a first OR input connected to
32 said output of said first NAND gate, a second OR input connected
33 to said output of said second inverter, a NAND input connected to
34 said output of said first AND-NOR gate and an output;
35 a third inverter (308) having an input connected to said
36 output of said second NAND gate and an output;
37 a fourth inverter (309) having an input connected to said
38 output of said second AND-NOR gate and an output;
39 a third AND-NOR (214) gate having a first AND input
40 connected to said output of said OR-NAND gate, a second AND input
41 connected to said output of said third inverter, a NOR input
42 connected to said output of said fourth inverter and an output;
43 and
44 a fifth inverter (311) having an input connected to said
45 output of said third AND-NOR gate and an output generating the
46 combined generate signal for the five bits.

1 32. (New) The carry look ahead circuit of claim 31, wherein:
2 said first, second and third AND-NOR gates include
3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and a first intermediate
5 node and a gate connected to said first AND input,
6 a second P-channel transistor having a source-drain path
7 connected between a supply voltage and said first
8 intermediate node and a gate connected to said second AND
9 input,
10 a third P-channel transistor having a source-drain path
11 connected between said first intermediate node and the
12 output and a gate connected to said NOR input,

13 a first N-channel transistor having a source-drain path
14 connected between said output and a second intermediate node
15 and a gate connected to said first AND input,

16 a second N-channel transistor having a source-drain path
17 connected between said second intermediate node and
18 ground and a gate connected to said second AND input, and

19 a third N-channel transistor having a source-drain path
20 connected between said output and ground and a gate
21 connected to said NOR input.

1 33. (New) The carry look ahead circuit of claim 31, wherein:
2 said first, second and third AND-NOR gates include

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said NOR input,

6 a second P-channel transistor having a source-drain path
7 connected between a supply voltage and said first
8 intermediate node and said output and a gate connected to
9 said first AND input,

10 a third P-channel transistor having a source-drain path
11 connected between said first intermediate node and said
12 output and a gate connected to said second AND input,

13 a first N-channel transistor having a source-drain path
14 connected between said output and a second intermediate node
15 and a gate connected to said first AND input,

16 a second N-channel transistor having a source-drain path
17 connected between said second intermediate node and
18 ground and a gate connected to said second AND input, and

19 a third N-channel transistor having a source-drain path
20 connected between said output and ground and a gate
21 connected to said NOR input.

1 34. (New) The carry look ahead circuit of claim 31, wherein:
2 said OR-NAND gate includes

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said second OR input,

6 a second P-channel transistor having a source-drain path
7 connected between said first intermediate node and said
8 output and a gate connected to said first OR input,

9 a third P-channel transistor having a source-drain path
10 connected between the supply voltage and said output and a
11 gate connected to said NAND input,

12 a first N-channel transistor having a source-drain path
13 connected between said output and a second intermediate node
14 and a gate connected to said OR input,

15 a second N-channel transistor having a source-drain path
16 connected between said second intermediate node and ground
17 and a gate connected to said first OR input, and

18 a third N-channel transistor having a source-drain path
19 connected between said second intermediate node and ground
20 and a gate connected to said second OR input.

1 35. (New) The carry look ahead circuit of claim 31, wherein:
2 said OR-NAND gate includes

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said second OR input,

6 a second P-channel transistor having a source-drain path
7 connected between said first intermediate node and said
8 output and a gate connected to said first OR input,

9 a third P-channel transistor having a source-drain path
10 connected between the supply voltage and said output and a
11 gate connected to said NAND input,

12 a first N-channel transistor having a source-drain path
13 connected between said output and a second intermediate node
14 and a gate connected to said first OR input,
15 a second N-channel transistor having a source-drain path
16 connected between said output and said second
17 intermediate node and a gate connected to said second OR
18 input, and
19 a third N-channel transistor having a source-drain path
20 connected between said second intermediate node and ground
21 and a gate connected to said NAND input.

1 36. (New) A 6-bit carry look ahead circuit forming a
2 combined propagate signal and a combined generated signal
3 comprising:
4 a first NAND gate (120) having a first input receiving a
5 propagate signal from the first bit, a second input receiving a
6 propagate signal from the second bit and an output;
7 a second NAND gate (121) having a first input receiving a
8 propagate signal from the third bit, a second input receiving a
9 propagate signal from the fourth bit and an output;
10 a third NAND gate (122) having a first input receiving a
11 propagate signal from the fifth bit, a second input receiving a
12 propagate signal from the sixth bit and an output;
13 a NOR gate (123) having a first input connected to said
14 output of said first NAND gate, a second input connected to said
15 output of said second NAND gate and an output;
16 a first inverter (315) having an input connected to said
17 output of said third NAND gate and an output;
18 a fourth NAND gate (124) having a first input connected to
19 said output of said third NOR gate, a second input connected to
20 said output of said first inverter and an output;

21 a second inverter (316) having an input connected to said
22 output of said fourth NAND gate and an output generating the
23 combined propagate signal for the six bits;

24 a first AND-NOR gate (215) having a first AND input
25 receiving a generate signal from the first bit, a second AND
26 input receiving a propagate signal from the second bit, a NOR
27 input receiving a generate signal from the second bit and an
28 output;

29 a second AND-NOR (216) gate having a first AND input
30 receiving a propagate signal from the fourth bit, a second AND
31 input receiving a generate signal from the third bit, a NOR input
32 receiving a generate signal from the fourth bit and an output;

33 a first OR-NAND gate (256) having a first OR input connected
34 to said output of said first AND-NOR gate, a second OR input
35 connected to said output of said second NAND gate, a NAND input
36 connected to said output of said second AND-NOR gate and an
37 output;

38 a third inverter (312) having an input receiving a generate
39 signal of the fifth bit and an output;

40 a fourth inverter (313) having an input connected receiving
41 a propagate signal of the sixth bit and an output;

42 a fifth inverter (314) having an input receiving a generate
43 signal of the sixth bit and an output;

44 a second OR-NOR gate (256) gate having a first OR input
45 connected to said output of said third inverter, a second OR
46 input connected to said output of said fourth inverter, a NAND
47 input connected to said output of said fourth inverter and an
48 output; and

49 a third AND-NOR gate (217) having a first AND input
50 connected to said output of said first OR-NOR gate, a second AND
51 input connected to said output of said second inverter, a NOR
52 input and an output;

53 a sixth inverter (317) having an input connected to said
54 output of said third AND-NOR gate and an output generating the
55 combined generate signal for the six bits.

1 37. (New) The carry look ahead circuit of claim 36, wherein:
2 said first, second and third AND-NOR gates include

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said first AND input,

6 a second P-channel transistor having a source-drain path
7 connected between a supply voltage and said first
8 intermediate node and a gate connected to said second AND
9 input,

10 a third P-channel transistor having a source-drain path
11 connected between said first intermediate node and the
12 output and a gate connected to said NOR input,

13 a first N-channel transistor having a source-drain path
14 connected between said output and a second intermediate node
15 and a gate connected to said first AND input,

16 a second N-channel transistor having a source-drain path
17 connected between said second intermediate node and
18 ground and a gate connected to said second AND input, and

19 a third N-channel transistor having a source-drain path
20 connected between said output and ground and a gate
21 connected to said NOR input.

1 38. (New) The carry look ahead circuit of claim 36, wherein:
2 said first, second and third AND-NOR gates include

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said NOR input,

6 a second P-channel transistor having a source-drain
7 path connected between a supply voltage and said first
8 intermediate node and said output and a gate connected to
9 said first AND input,

10 a third P-channel transistor having a source-drain path
11 connected between said first intermediate node and said
12 output and a gate connected to said second AND input,

13 a first N-channel transistor having a source-drain path
14 connected between said output and a second intermediate node
15 and a gate connected to said first AND input,

16 a second N-channel transistor having a source-drain path
17 connected between said second intermediate node and
18 ground and a gate connected to said second AND input, and

19 a third N-channel transistor having a source-drain path
20 connected between said output and ground and a gate
21 connected to said NOR input.

1 39. (New) The carry look ahead circuit of claim 36, wherein:
2 said first and second OR-NAND gates include

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said second OR input,

6 a second P-channel transistor having a source-drain path
7 connected between said first intermediate node and said
8 output and a gate connected to said first OR input,

9 a third P-channel transistor having a source-drain path
10 connected between the supply voltage and said output and a
11 gate connected to said NAND input,

12 a first N-channel transistor having a source-drain path
13 connected between said output and a second intermediate node
14 and a gate connected to said OR input,

15 a second N-channel transistor having a source-drain
16 path connected between said second intermediate node and
17 ground and a gate connected to said first OR input, and
18 a third N-channel transistor having a source-drain path
19 connected between said second intermediate node and ground
20 and a gate connected to said second OR input.

1 40. (New) The carry look ahead circuit of claim 36, wherein:
2 said first and second OR-NAND gate include
3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said second OR input,
6 a second P-channel transistor having a source-drain path
7 connected between said first intermediate node and said
8 output and a gate connected to said first OR input,
9 a third P-channel transistor having a source-drain path
10 connected between the supply voltage and said output and a
11 gate connected to said NAND input,
12 a first N-channel transistor having a source-drain path
13 connected between said output and a second intermediate node
14 and a gate connected to said first OR input,
15 a second N-channel transistor having a source-drain path
16 connected between said output and said second
17 intermediate node and a gate connected to said second OR
18 input, and
19 a third N-channel transistor having a source-drain path
20 connected between said second intermediate node and ground
21 and a gate connected to said NAND input.

1 41. (New) A 6-bit carry look ahead circuit forming a
2 combined propagate signal and a combined generated signal
3 comprising:

4 a first NAND gate (125) having a first input receiving a
5 propagate signal from the first bit, a second input receiving a
6 propagate signal from the second bit and an output;

7 a second NAND gate (126) having a first input receiving a
8 propagate signal from the third bit, a second input receiving a
9 propagate signal from the fourth bit and an output;

10 a third NAND gate (127) having a first input receiving a
11 propagate signal from the fifth bit, a second input receiving a
12 propagate signal from the sixth bit and an output;

13 a first NOR gate (128) having a first input connected to
14 said output of said second NAND gate, a second input connected to
15 said output of said third NAND gate and an output;

16 a first inverter (319) having an input connected to said
17 output of said first NOR gate and an output;

18 a second NOR gate (129) having a first input connected to
19 said output of said first NAND gate, a second input connected to
20 said output of said first inverter and an output generating the
21 combined propagate signal for the six bits;

22 a first AND-NOR gate (218) having a first AND input
23 receiving a propagate signal from the second bit, a second AND
24 input receiving a generate signal from the first bit, a NOR input
25 receiving a generate signal from the second bit and an output;

26 a second inverter (318) having an input connected to said
27 output of said first AND-NOR gate and an output;

28 a second AND-NOR (219) gate having a first AND input
29 receiving a propagate signal from the fourth bit, a second AND
30 input receiving a generate signal from the third bit, a NOR input
31 receiving a generate signal from the fourth bit and an output;

32 a third AND-NOR (220) gate having a first AND input
33 receiving a propagate signal from the sixth bit, a second AND
34 input receiving a generate signal from the fifth bit, a NOR input
35 receiving a generate signal from the sixth bit and an output;

36 a OR-NAND gate (258) having a first OR input connected to
37 said output of said second AND-NOR gate, a second OR input
38 connected to said output of said third NAND gate, a NAND input
39 connected to said output of said third AND-NOR gate and an
40 output;

41 a fourth AND-NOR gate (221) having a first AND input
42 connected to said output of said first OR-NOR gate, a second AND
43 input connected to said output of said first NOR gate, a NOR
44 input and an output; and

45 a third inverter (320) having an input connected to said
46 output of said fourth AND-NOR gate and an output generating the
47 combined generate signal for the six bits.

1 42. (New) The carry look ahead circuit of claim 41, wherein:
2 said first, second, third and fourth AND-NOR gates include

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said first AND input,

6 a second P-channel transistor having a source-drain path
7 connected between a supply voltage and said first intermediate node and a gate connected to said second AND
8 input,

9 a third P-channel transistor having a source-drain path
10 connected between said first intermediate node and the
11 output and a gate connected to said NOR input,

12 a first N-channel transistor having a source-drain path
13 connected between said output and a second intermediate node
14 and a gate connected to said first AND input,

15 a second N-channel transistor having a source-drain path
16 connected between said second intermediate node and
17 ground and a gate connected to said second AND input, and

19 a third N-channel transistor having a source-drain path
20 connected between said output and ground and a gate
21 connected to said NOR input.

1 43. (New) The carry look ahead circuit of claim 41, wherein:
2 said first, second, third and fourth AND-NOR gates include

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said NOR input,

6 a second P-channel transistor having a source-drain path
7 path connected between a supply voltage and said first
8 intermediate node and said output and a gate connected to
9 said first AND input,

10 a third P-channel transistor having a source-drain path
11 connected between said first intermediate node and said
12 output and a gate connected to said second AND input,

13 a first N-channel transistor having a source-drain path
14 connected between said output and a second intermediate node
15 and a gate connected to said first AND input,

16 a second N-channel transistor having a source-drain path
17 path connected between said second intermediate node and
18 ground and a gate connected to said second AND input, and

19 a third N-channel transistor having a source-drain path
20 connected between said output and ground and a gate
21 connected to said NOR input.

1 44. (New) The carry look ahead circuit of claim 41, wherein:
2 said OR-NAND gate includes

3 a first P-channel transistor having a source-drain path
4 connected between a supply voltage and an first intermediate
5 node and a gate connected to said second OR input,

6 a second P-channel transistor having a source-drain path connected between said first intermediate node and said output and a gate connected to said first OR input,
7
8 a third P-channel transistor having a source-drain path connected between the supply voltage and said output and a gate connected to said NAND input,
9
10 a first N-channel transistor having a source-drain path connected between said output and a second intermediate node and a gate connected to said OR input,
11
12 a second N-channel transistor having a source-drain path connected between said second intermediate node and ground and a gate connected to said first OR input, and
13
14 a third N-channel transistor having a source-drain path connected between said second intermediate node and ground and a gate connected to said second OR input.

1 45. (New) The carry look ahead circuit of claim 41, wherein:
2 said OR-NAND gate includes
3 a first P-channel transistor having a source-drain path connected between a supply voltage and an first intermediate node and a gate connected to said second OR input,
4
5 a second P-channel transistor having a source-drain path connected between said first intermediate node and said output and a gate connected to said first OR input,
6
7 a third P-channel transistor having a source-drain path connected between the supply voltage and said output and a gate connected to said NAND input,
8
9 a first N-channel transistor having a source-drain path connected between said output and a second intermediate node and a gate connected to said first OR input,
10
11 a second N-channel transistor having a source-drain path connected between said output and said second

17 intermediate node and a gate connected to said second OR
18 input, and

19 a third N-channel transistor having a source-drain path
20 connected between said second intermediate node and ground
21 and a gate connected to said NAND input.